

Testimony of

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**Petition of US Bureau of Reclamation &
California Department of Water Resources
Concerning Delta Salinity Draft Cease and Desist Orders and
Water Quality Response Plan Hearing**

**Before the State Water Resources Control Board
Sacramento, California**

Thursday, June 25, 2009

The purpose of my testimony is to provide the State Water Resources Control Board with the California Water Impact Network's comments concerning the US Bureau of Reclamation (USBR) and the California Department of Water Resources' (DWR) May 29th petition requesting modification of Cease and Desist Order (CDO, issued as Order WR 2006-0006) to USBR and DWR on February 15, 2006. The California Water Impact Network, a non-profit corporation advocates for environmentally sensitive and equitable uses of water throughout California.

Our comments seek to deepen the historical record before the State Water Board of interconnections between salinity control and anadromous fishery protection in the Delta's San Joaquin River system as seen through the lenses of draft and adopted water quality control plans, draft and adopted water right decisions, and scientific studies that shed light on past state water boards along the way. In so doing, we will note a pattern of the State Water Resources Control Board delaying and avoiding decisive action. For our recommendations on CDO Part A modifications, as well as for modifications to the Bay-Delta Water Quality Control Plan, we intend to draw ideas for State Board consideration from paths not taken regarding fish protection and southern Delta salinity control—and urge the State Board to take them now as a result of this hearing.

In the CDO, adopted February 15, 2006, the State Water Board ordered DWR and USBR to take corrective actions under a time schedule to end the threat of noncompliance with their permit and license conditions by July 1, 2009, this coming Wednesday. Condition A.2 of the CDO requires DWR and USBR to develop and implement a plan to obviate the threat of noncompliance with the interior southern Delta salinity objectives. Condition A.2 specifies that the compliance plan may provide for implementation of permanent barriers in the Delta or other measures if those measures would provide the same degree of salinity control as the barriers. Condition A.6 of Order WR 2006-0006 requires DWR and USBR to submit quarterly reports on progress towards compliance and an updated projection of the final compliance date.

The petition prompting the State Water Board to hold this hearing does not itself specifically state what modifications to the CDO USBR and DWR seek. It simply states

that the South Delta Improvement Program (SDIP) permanent operable gates will not be installed by July 1, 2009, “to satisfy the Order” and promises additional information in the quarterly CDO compliance report to be submitted within the next 10 days.

DWR then submitted to the State Water Board DWR’s quarterly CDO compliance report dated June 1, 2009, which also represents USBR’s compliance as well. This report indicates that it and USBR expect to continue complying with the south Delta agricultural salinity standards contained in the 2006 Bay-Delta Water Quality Control Plan and Decision 1641 (revised March 2000) through August 2009 (based on modeling results, on which we discuss more below) and informs the State Water Board that because of scheduling challenges resulting from the National Marine Fisheries Service’s (NMFS) withholding of a reasonable and prudent alternative for the South Delta Improvement Program permanent operable gates in the south Delta, it anticipates the permanent operable gates will not be operational until the agricultural season of 2016, seven years hence. NMFS’ action forces DWR and the USBR to implement other corrective actions to meet the salinity standards in D-1641 and the 2006 Water Quality Control Plan—we hope. We anticipate that not only would DWR and USBR request a time extension for compliance with the standards, but that they will request the State Water Board relax the standards in the upcoming Water Quality Control Plan review process. And we are deeply concerned the State Water Board would grant both of these requests.

The California Water Impact Network believes both a time extension and relaxation of water quality standards are unacceptable outcomes of this hearing. DWR and the USBR must comply with the southern Delta salinity objectives and make good faith and immediate progress toward fish doubling goals contained in state and federal laws, D-1641, and the 2006 Water Quality Control Plan. Our position is founded on these reasons:

1. The 1995 and 2006 Water Quality Control Plans and Water Rights Decision 1641 have clearly failed as water quality control policy for the Bay-Delta Estuary as demonstrated by the catastrophic declines of fisheries and other measures of ecological health and recurring violations by DWR and USBR of the agriculture-protective salinity standards of the south Delta at any time of year.
2. Recent biological opinions and other scientific reviews concerning Delta smelt and salmonids in the context of the operations of the State Water Project and Central Valley Project point to the detriment to fisheries and pelagic organisms caused by operation of the projects’ reservoirs and Delta export pumps.
3. DWR and USBR cling to a strictly tidal barrier approach to addressing salinity and fish protection issues in the south Delta that is ineffective as a means to meet multiple objectives, a stalling tactic until vulnerable fish species go extinct and the need for the standards relaxes, when other options are available to them which may provide more reliable and sustainable protection for all beneficial uses in the south Delta.

The State Water Board should tolerate no further delay in long-term enforcement of the salinity standards in the south Delta by continuing its enforcement of the Cease and Desist Order against the DWR and the USBR. The CDO's compliance deadline is at hand. DWR and USBR can be expected to ask you to move the deadline back, but you said collectively in 2006:

Considering that the objectives were first adopted in the water quality control plan in 1978, and there is evidence that salinity is a factor in limiting crop yields for southern Delta agriculture, the State Water Board will not extend the date for removing the threat of non-compliance beyond July 1, 2009.¹

The State Water Board should also expand the CDO to include assessment of the maximum penalties allowable under law so that DWR and USBR will have incentive to take rapid action protective of fish populations and agricultural production.

What follows in our testimony does not inspire confidence that the State Water Board will hold fast to the July 1, 2009, deadline for compliance. But there is no time like the present to buck the trend prior Boards established.

The California Water Impact Network incorporates by reference the petition requesting reconsideration of WR 2008-0029-EXEC submitted by Bill Jennings of the California Sportfishing Protection Alliance to the State Water Resources Control Board, dated July 30, 2008.

A Record of Delay on Salinity and Fish Protection

The State Water Board regulates salinity and fish protection standards separate from each other, and they are held separate from flow requirements as well. Fish, of course, live in water and cannot separate salinity conditions from flow conditions, temperature, toxic contaminants, the concentration of dissolved oxygen, and so forth. We separate the control of those factors by our interventions into the Bay-Delta estuary and its watershed tributaries; fish must adapt to these conditions, or face consequences.

Our record of delay begins with the State Water Board's attempts at salinity control, which we summarize in Exhibit C-WIN-4. Historians W. Turrentine Jackson and Alan M. Paterson reported in 1977 that the California Department of Water Resources initiated the San Joaquin Valley Drainage Investigation in 1957 after legislative hearings on drainage and water quality issues associated with the 1957 California Water Plan.² The Burns Porter Act, authorized by the California voters in November 1960, contained language calling for DWR to build "facilities for removal of drainage water from the San Joaquin Valley."³

A 1980 study prepared jointly by the South Delta Water Agency and the US Water and Power Resources Service offered evidence why the Legislature crafted the

¹ State Water Resources Control Board, Order WR 2006-0006, p. 27. This order is hereafter cited as CDO.

² W. Turrentine Jackson and Alan M. Paterson, *The Sacramento-San Joaquin Delta: The Evolution and Implementation of Water Policy: An Historical Perspective*, University of California, Davis, California Water Resources Center Contribution No. 163, June 1977, pp. 136-139.

³ California Water Code Section 12934(d)(4), reproduced in California Department of Water Resources, Bulletin 200: *California State Water Project: Volume I: History, Planning, and Early Progress*, November, 1974, Appendix B, p. 123.

Burns-Porter Act to take this step.⁴ This study's purposes were to analyze, first, the effect of the operation of the CVP upon the San Joaquin River inflow (quality and volume) to the Delta; and second, the effect of the operation of the CVP exports near Tracy upon the in-channel water supply in the southern Delta. For this testimony, we are more concerned with its first purpose, though the matter of water levels is of vital importance to the South Delta Water Agency and its constituent farmers who divert their irrigation supplies from local channels.

To address the first purpose, the 1980 study examined available historical data on water quality, river flows, and water supplies to determine what, if any, changes occurred affecting the southern Delta. It describes the San Joaquin River system, including the federal Central Valley Project, the southern Delta region, and its data sources. It describes the investigation procedure, and examines the water quantity and water quality effects of upstream developments on the San Joaquin River system, and its final chapter describes the effects of the Central Valley Project and State Water Project export pumps near Tracy.

The 1980 study found dramatic deterioration in water quality in the San Joaquin River system that affects the southern Delta. In examining historical runoff and salinity data (measured as total dissolved solids), the joint study analyzed the composition of salts reaching Vernalis and related this to composition of salts originating from identifiable sources, including tributary streams, imported water, and drainage returns from irrigated lands. The results of this analysis are summarized in Exhibit C-WIN-3. One sample of the dramatic changes in salinity that affected the southern Delta with the development and operation of the Central Valley Project and the attendant increase in irrigated acreage in the San Joaquin Valley states:

Comparing the average monthly TDS (over the entire year), load-flow regressions show a 1950-1969 increase of 43 percent—from 259 mg/L to 371 mg/L. For the 1950s alone the percentage increase is about 22 percent and for the 1960s, 65 percent....Thus, according to this analysis, in this first decade after the CVP went into operation, about 56 percent of the increase in average TDS was caused simply by a reduction in flow from upstream sources; the remaining 44 percent was a result of increased salt burden, perhaps associated with an expansion of irrigated lands in the basin. Similarly in the 1960s (compared to the 1930s and 1940s) about 27 percent of the average increase in TDS...can be accounted for by a reduction in flow and 73 percent attributed to increased salt burden. It is of interest to note here that the absolute change apparently caused by reduction in flow changed relatively little from the 1950s to the 1960s...while that charged to an increase in salt burden increased about four times [...]. This is consistent with other analyses that indicate a progressive buildup in salt load in the San Joaquin system.⁵

On matters of salinity discharge regulation, the State Water Board demonstrates through a chronology of its treatment of southern Delta salinity standards a stalwart

⁴ US Water and Power Service and the South Delta Water Agency, *Effects of the CVP Upon the Southern Delta Water Supply, Sacramento-San Joaquin River Delta, California*, June 1980. Available through the Water Resources Center Archives, University of California, Berkeley, California.

⁵ *Ibid.*, p. 126.

patience in first adopting salinity standards as part of water rights decisions, and then in deciding to assign responsibility for compliance with these standards. (Exhibit C-WIN-4) Beginning with its Decision 893, and extending through its Decision 1379 in 1971, the State Water Board declined to establish southern Delta salinity standards even though much of the data available to the 1980 study likely existed. The State Water Boards of the past, however, preferred instead to reserve jurisdiction in the matter of salinity control (and fish protection in several decisions) to some unspecified future date. In Decision 1020, adopted by the State Water Rights Board in 1961, the Board acknowledges a warning from the Delta Water Users' Association and the San Joaquin County Flood Control and Water Conservation District that water quality in the San Joaquin River was deteriorating, and had since 1950, presaging the water quality results identified in the joint SDWA/USWPRS 1980 study. These parties pointed out in 1961 that (in the words of D-1020):

...the development of the San Luis Unit will further degrade water quality in the San Joaquin River and in the Delta. It is contended that return flow from the San Luis service area will contain high concentrations of salts and if added to those already found in the San Joaquin River northward from Mendota Pool, will adversely affect the water quality for diverters along the stream and in the Delta. At the same time, the parties point out that the construction of a master drainage system envisioned as one possible solution to the problem in [citation] will intercept all return flows for conveyance northward to San Francisco Bay, thereby reducing the flow of water in the lower San Joaquin River.⁶

The State Water Rights Board in D-1020 took note of the Burns-Porter Act's proposed San Joaquin Valley drainage water facilities and dismissed the Delta and San Joaquin County water users' concerns by observing that reduced San Joaquin River flows from drainage return water being diverted to the "drainage facilities":

will result in the interception of drainage water north of Mendota Pool rather the interception of the drainage water from the San Luis Unit [north of the expected route of the San Luis Drain]. [citation] Therefore the contention that the construction of a master drainage system will reduce the quantity of water available in the lower San Joaquin River is clearly outside of the issues under consideration in connection with [D-1020].⁷

The State Water Rights Board did reserve its continuing jurisdiction concerning salinity control in Term 9 of D-1020, but it would be another 17 years before south Delta salinity concerns would be reflected in the water quality objectives of the 1978 Water Quality Control Plan. The Board continued to reserve its jurisdiction on salinity control matters in water right decisions through 1970.⁸

⁶ State Water Rights Board, Decision 1020, June 30, 1961, p. 15.

⁷ D-1020, p. 15-16.

⁸ CDO, Figure 2, pp. 8-9 states regarding this period of State Water Rights Board regulation: "During a twelve-year period the State Water Board adopted six difference decisions (Decisions 893, 990, 1020, 1250, 1308, and 1356) approving permits for various components of the federal CVP operated by USBR. The permits issued as a result of the decisions included a term by which the Water Board reserved jurisdiction to revisit salinity control requirements. (Decision 893, p. 71, Condition 12; Decision 990, p. 86, Condition 25; Decision 1020, p. 21, Condition 9; Order Extending Time in Which to Formulate Terms and

This record of delay in establishing salinity control policy is compounded by the lack of accountability of regional boards to the State Water Board, again in the area of salinity control. The State Water Board in WQ 85-1 (relating to selenium pollution of Kesterson National Wildlife Refuge in the early 1980s) directed the Central Valley Regional Water Quality Control Board to “initiate a process to develop specific water quality objectives for the San Joaquin River basin that will result in the adoption of appropriate basin plan amendments by the Regional Board and the development of a program to regulate agricultural drainage discharges.”⁹

D-1641, adopted by the State Water Board in 2000, described salinity problems of the San Joaquin River system as having two principal causes: lack of sufficient diluting flows, and drainage discharges largely from western San Joaquin Valley agricultural irrigators. The Board continued:

Although releases of dilution water could help meet the southern Delta objectives, regional management of drainage water is the preferred method of meeting the objectives. The Central Valley RWQCB is currently in the process of setting salinity objectives for the San Joaquin River. [cite] The Central Valley RWQCB is hereby directed promptly to develop and adopt salinity objectives and a program of implementation for the main stem of the San Joaquin River upstream of Vernalis.¹⁰

Twenty-four years after WQ 85-1, California still awaits this important basin plan amendment. It is over nine years since the State Water Board issued this directive in D-1641 to the Central Valley Regional Water Quality Control Board. The Regional Board still appears to be holding committee meetings to gather stakeholder input for the basin plan amendment. Meanwhile, the San Joaquin River continues delivering an average of 900,000 tons of salt to the southern Delta each year, according to Central Valley Regional Board analysis.¹¹ We could find no schedule or workplan on the Regional Board’s CV-SALTS website indicating when an effective basin plan amendment would be accomplished by the Central Valley Regional Board.

Conditions Relative to Salinity Control Pursuant to Decision 990 and Decision 1020, p. 2; Decision 1250, p. 5, Condition 9; Decision 1308, p. 11-12, Condition 8; Decision 1356, p. 17, Condition 21.)”

⁹ Quote here is from D-1641, p. 85. See also State Water Resources Control Board, Order WQ 85-1, February 5, 1985, Conclusion 11, p. 63. Unfortunately, in 1985 the State Board allowed the Central Valley Regional Board to consider using not just waste discharge requirements to regulate drainage discharges from irrigated lands, but also “waivers of discharge requirements in appropriate circumstances” which C-WIN and others believe has been used by the Central Valley Regional Board to excess in allowing heavily saline (and other problem constituents) drainage discharges in the San Joaquin River basin to continue.

¹⁰ State Water Resources Control Board, *Revised Water Right Decision 1641: In the Matter of Implementation of Water Quality Objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary; A Petition to Change Points of Diversion of the Central Valley Project and the State Water Project in the Southern Delta; and A Petition to Change Places of Use and Purposes of Use of the Central Valley Project*, revised in accordance with Order WR 2000-02, March 15, 2000, p. 84. Hereinafter cited as D-1641.

¹¹ Central Valley Regional Water Quality Control Board, *Salinity in the Central Valley: An Overview*, May 2006, Table 3, p. 30. Accessed online at http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/programs_policies_reports/index.shtml, 15 June 2009.

Again, if the State Water Board continues to separate salinity control from fishery protection, the Board will have failed the fish. The data on fish bear this out in the decline of Central Valley salmonid populations since the 1980s, and their crash during this decade of record Delta export pumping. (Exhibit C-WIN-5.)

The 1992 Central Valley Project Improvement Act requires the US Interior Department to undertake actions that will double the populations of anadromous fish species that migrate through the Delta as compared with their historical average populations between 1967 and 1991.¹² While Congress authorized separate activities from the AFRP for the San Joaquin River between Friant Dam and the Mendota Pool, AFRP activities and State Water Board actions in support of AFRP can and must take account of the need for flows in the San Joaquin River system’s other tributaries, the Merced, Tuolumne, and Stanislaus rivers. Species affected under this Act include: all races of Central Valley salmonids, Central Valley steelhead, white sturgeon, green sturgeon, striped bass, and American shad.

Population	1967-1991 Average	1992-2008 Average	AFRP Population Goal	1992-2008 Average as Percent of AFRP Goal
All Races	497,240	452,446	990,000	45.7%
Fall-Run Central Valley Chinook	374,217	408,977	780,000	52.4%
Winter-Run Central Valley Chinook	54,417	7,787	110,000	7.1%
Late Fall-Run CV Chinook	34,182	19,942	68,000	29.3%
Spring-Run Chinook	34,425	15,738	68,000	23.1%
Fall-Run Central Valley Chinook – Stanislaus	10,868	6,041	22,000	27.5%
Fall-Run Chinook Tuolumne	18,946	7,975	38,000	21.0%
Fall-Run Chinook Merced	9,004	7,582	18,000	42.1%
Fall-Run Chinook San Joaquin	38,383	21,598	Goal not set	NA
Central Valley White Sturgeon	77,525	78,649	155,050	50.7%
American Shad	2,193	2,848	4,300	66.2%
Striped Bass	1,252,259	969,262	2,500,000	38.8%

Source: US Fish and Wildlife Service, data accessed 14 June 2009 at <http://www.fws.gov/stockton/afrp/>. Summarized from Fish and Wildlife Service data supporting charts in Exhibit C-WIN-5.

Table C-WIN-1 shows that present average populations for anadromous fish species of the Central Valley fall well short of the AFRP doubling goal set out in the 1992 Central Valley Project Improvement Act. Moreover, fall-run Central Valley Chinook salmon commercial fisheries were closed in the 2008 and 2009 for fear that the returns from the previous fall to spawn have been far too small and that any fishing would irrevocably harm these Chinook cohorts. Exhibit C-WIN-5 contains selected charts from the US Fish and Wildlife Service’s Anadromous Fish Restoration Program’s web site, and the supporting time series data show that:

¹² Central Valley Project Improvement Act of 1992, Section 3406(b)(1), accessed at <http://www.fws.gov/stockton/afrp/title34.asp>.

- Among all races, populations decreased over 90 percent since 2004 from nearly 570,000 adult Chinook salmon to less than 55,000.
- Among fall-run Central Valley Chinook salmon, there has been a 92 percent decrease since 2004 from nearly 530,000 adults to 42,100 in 2008.
- Among late fall-run Central Valley Chinook salmon, there has been a 91 percent decline since 2002 from over 56,000 adults to about 4,600.
- Among winter-run Central Valley Chinook salmon, there has been a 89 percent decrease since 2005 from over 26,000 adults to about 2,800. In 1969, there was an estimated 238,000 winter-run Central Valley Chinook salmon. (Exhibit C-WIN-5.)

These fish population crashes demonstrate a failure not only to achieve a legislated environmental goal of doubling anadromous fish populations, but a dangerously precipitous decline in their fortunes stemming from the artificial hydraulic environment they inhabit—and society’s failure to regulate it in a sustainable fashion. Congress specifically singled out the State Water Resources Control Board in the Central Valley Project Improvement Act of 1992 to do its part to double anadromous fish populations through its water rights authority. In 1988, the California Legislature adopted as state policy a goal “to significantly increase the production of salmon and steelhead trout by the end of the Century,” creating “a program that strives to double the current natural populations of salmon and steelhead resources.”¹³ The State Water Board proposed salinity standards and increased flows for fish in 1988 and again in 1992 that may have been more protective of Delta agriculture and Central Valley and Delta fisheries, especially given some of the findings and conclusions of recent biological opinions we will discuss shortly. The State Water Board has timidly waited, cautious about confronting established water right holders and mandating water conservation and land retirement strategies to support salinity standard and fish protection compliance, waiting for the Delta Vision Task Force to finish its work in 2008, and now waiting for the Bay Delta Conservation Plan process to conclude its work by 2012.

The opportunities for stalwart patience and delay increase: the Central Valley Regional Board is being asked by the operators of the Grasslands Bypass Project to extend its permitted discharge of highly seleniferous and saline irrigation drainage to the San Joaquin River through 2019 in hopes that project operators will successfully fund and develop a pilot drainage water treatment technology that is cost effective. And on the matter before you today, DWR informs the State Water Board through its recent CDO compliance reports that permanent operable tidal gates on interior Delta channels and the head of Old River will be completed first in 2008, then in 2009, then in 2012 (as reported in the Delta Smelt biological opinion from December 2008), and now not until 2016. It seems likely that DWR will request modification of the CDO A.2 schedule so that this schedule for South Delta Improvement Program’s permanent operable gates will become the schedule for compliance.

Further delay would continue justice denied to the communities dependent on southern Delta agriculture, and on these vulnerable fish for their livelihoods, as well as to the fish themselves, and the millions of consumers who, for the sake of protecting certain water service contracts and water rights are denied the choice of having salmon available

¹³ California Fish and Game Code Section 6902(a).

to purchase as *affordable food for people*—part of a varied and healthful diet. This travesty is justified through sophisticated methods aimed at simple governmental delay in the service of entrenched interests. Instead, the State Water Board must do everything it can *immediately*, including through this CDO evidentiary hearing, to turn this situation around.

Salinity and Fish Protection: Paths Not Taken

The State Water Board’s CDO against DWR and USBR in this matter turns on how much longer will continue their reliance on a strategy of tidal barrier installation and removal (for the temporary barriers) and construction and operation (for proposed permanent operable gates). It is the sole strategy employed by the agencies to address its salinity standard compliance and fishery protection problems in the southern Delta, yet the State Water Board’s CDO thoughtfully and pragmatically offered several options to DWR and USBR to reach compliance through equivalent means.

Evidence abounds of delay and avoidance of pragmatic solutions by the projects and their contractors. Tidal barriers as an engineering solution to water quality and fish passage problems through south Delta channels first appeared in the 1991 Water Quality Control Plan (a plan which the US Environmental Protection Agency later rejected) and then received consideration in State Water Board policy in Draft Water Right Decision 1630, which was not adopted by the State Water Board. Analysis there bears consideration by the State Water Board today.

Released in November 1992, Draft D-1630 called for San Joaquin and Sacramento River pulse flows (measured at Vernalis and Rio Vista) between April 20 and May 10 each year (and adjusted by water year type). The San Joaquin River pulse flow standard was a minimum *daily* flow; the Sacramento River pulse flow standard was a *14-day running average* of minimum daily flows. (Exhibit C-WIN-6.) In Draft D-1630, *the State Water Board indicated it was willing to act to protect fish and wildlife with extra flows in the San Joaquin River at Vernalis that exceeded flows adopted in D-1641 and employed in the Vernalis Adaptive Management Program for most water year types except critical years. At the same time it sought to uphold the 1978 Water Quality Control Plan southern Delta salinity standard.*¹⁴

Draft D-1630 proposed findings that included observations that vary from widely-shared opinions adhered to in the water community today for addressing water quality problems in the south Delta. First, the State Water Board described San Joaquin River fall-run Chinook salmon smolt survival models constructed by the US Fish and Wildlife Service “with and without a barrier at the head of Old River.” Acknowledging methodological concerns with the models—specifically that inclusion of a Delta exports factor in both models “does not improve the regression analysis with the barrier in place—

...even with a barrier at the head of Old River USFWS believes smolts would be exposed to negative impacts associated with the draft of water to the export

¹⁴ State Water Resources Control Board, *Draft Water Right Decision 1630: San Francisco Bay/Sacramento San Joaquin Delta Estuary*, December 1992, dated November 17, 1992. Hereafter cited Draft D-1630. The Central Valley Project Improvement Act of 1992 had been signed into law less than three weeks earlier in late October 1992.

facilities. Because the relationship with a barrier depicts relatively high survival at very low flows, the USFWS presents this relationship with reservations.¹⁵

...

The barrier at the head of Old River is recommended by the fishery agencies to reduce the mortality of smolts of San Joaquin River origin attributable to the export pumps. The placement of a barrier at the head of Old River during the spring would prevent San Joaquin River Chinook salmon smolts from being diverted down Old River towards the export pumps. [citation] However, if export rates are unchanged from present conditions, such a barrier would result in increased reverse flows in lower Old and Middle Rivers, and could adversely affect smolt and other estuarine fish species. [citation] The placement of a barrier at the head of Old River during the fall (September 1 through November 30) may improve temperature and dissolved oxygen conditions for adult Chinook salmon in the San Joaquin River near Stockton.¹⁶

Draft D-1630 indicates the State Water Board's ambivalence toward barriers on south Delta channels of Old, Middle and the San Joaquin rivers. For once, the Board chose a path of caution in considering an engineering solution to the salinity and fish passage problems of the south Delta, concluding:

The effects of a spring barrier at the head of Old River on interior Delta flow patterns and on the entrainment of fishes other than out-migrating Chinook salmon smolts should be investigated. The results will be evaluated during the State Water Board's annual reviews. The results of placing a fall barrier at the head of Old River should be evaluated to determine its effects on interior Delta flow patterns and whether it traps in-migrating adult Chinook salmon.¹⁷

The State Water Board in late 1992 instead opted to propose assigning responsibility to DWR and USBR to provide pulse flows from both the Sacramento and San Joaquin rivers, using many means at their disposal: "by release of natural flow or water in storage, by operation of the Delta Cross Channel gates, or by other measures or combinations of these and other measures, water quality conditions, and flow rates in the channels of the Delta and Suisun Marsh equal to or better than the standards" that were proposed to be established under Draft D-1630.¹⁸ The Board was clearly offering a number of "arrows" for DWR and USBR's quiver to address pulse flows flexibly for Draft D-1630 compliance. The Board also took the novel step of assigning responsibility for contributions of water to spring pulse flows (capped at 150,000 AF in any year) from San Joaquin River tributary water right holders, including PG&E, Calaveras County Water District, Oakdale and South San Joaquin Irrigation Districts, USBR, Merced, Turlock, and Modesto Irrigation Districts, and the City and County of San Francisco.¹⁹

¹⁵ Draft D-1630, p. 35.

¹⁶ Draft D-1630, p. 36-37.

¹⁷ Draft D-1630, p. 44.

¹⁸ Draft D-1630, p. 107-108.

¹⁹ Draft D-1630, p. 108, and Table V.

Draft D-1630 retained the 1991 Water Quality Control Plan southern Delta salinity standards, including a 30-day running average for the electrical conductivity objectives. (Exhibit C-WIN-6.)

In 1992, Draft D-1630 was issued at the tail end of a six-year drought. This proposed water right decision also contained numerous water conservation requirements on both urban and agricultural water users that, had they been implemented, may well have reduced water supply allocation impacts in the long run in California, including today in 2009.

Another path not followed by the State Water Board was its October 1988 draft Water Quality Control Plan, the first Bay-Delta Plan issued after the Appellate Court Decision in *United States v. State Water Resources Control Board* (the Racanelli Decision). Like Draft D-1630 in 1992, this Draft Plan was pulled back from the brink of adoption. This Draft Plan called for:

- A new “California water ethic” that included a prominent role for water conservation.
- Reducing the 30-day running average for the Vernalis and interior Delta salinity standards to a 14-day running average (a tightening up of the standard to catch more exceedances should they occur) for the electrical conductivity thresholds (Exhibit C-WIN-7); and
- Detailed higher flow regimes organized by water year types reflecting intense study and interest by the State Water Board of that era in how fisheries and hydraulic regimes functioned together before and after the state and federal projects began operating.

This Draft Water Quality Control Plan had a bias toward action on behalf of fish and wildlife and the public interest in water (i.e., water conservation requirements as terms and conditions on water right permits) that cannot be found in any adopted water quality control plan or water right decision since 1993. And they considered alternatives in the 1988 Plan, something that has not been done since the 1995 Water Quality Control Plan, which adopted as its preferred alternative the Bay-Delta Accord water quality standards.

Instead, their recommended alternative would have looked to the 1953-1987 historical average flows from the San Joaquin River basin at Vernalis, and proposed absolute export limits by month during summer months. These export limits could have been increased on condition that positive downstream flows are maintained with a combined flow rate in Old and Middle rivers of at least 500 cubic feet per second (cfs). (Exhibit C-WIN-7, footnote 12.) Under their recommended plan in 1988, the State Water Board stated:

Under this alternative, positive flows occur only about 20 percent of the time during April - July. It does reduce the magnitude of reverse flows compared to present conditions. *A safe level of exports is not known. However, pre-SWP spring export rates appears [sic] to be a reasonable interim goal until a safe level of exports is found.*²⁰

²⁰ State Water Resources Control Board, *Draft Water Quality Control Plan for Salinity, San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, October 1988, p. 7-32. Emphasis added.

We are now in a situation where the once-ballyhooed Bay-Delta Accord way of regulating water quality in the Bay-Delta, including its joint point of diversion, its Vernalis Adaptive Management Program, its San Joaquin River Agreement for providing experimental pulse flows, its CalFED Record of Decision, the ghastly, expensive, and failed Environmental Water Account²¹, and record rates of export pumping from 2000 to 2007—they add up in mid-2009 to the fast-dwindling numbers of anadromous fish and the commercial fishery closures of 2008 and 2009, the deeply troubling Pelagic Organism Decline, and a State Water Resources Control Board that no longer stands for water stewardship, especially when earlier proposals—the paths not taken—of 1988 and again in 1992 are compared to today’s highly incremental inaction on behalf of the public interest.

D-1641 declared that there is a public interest to protect in Delta agriculture²² and assigned responsibility for maintenance of the standards in the southern Delta to DWR and USBR. There is also a public interest that deserves declaration by the State Water Board that it is congressional intent that the anadromous fisheries of California’s Central Valley be restored to population levels twice what they were in the average of the period 1967 to 1991, and that to honor this congressional intent—reflecting the will of the American people, not just the citizens of California—the State Water Board should declare as part of this CDO that there is a public interest served in the protection of anadromous fisheries for their intrinsic ecological worth as fish species as well as the economic and ecological livelihood they provide to numerous human communities, including the native Indian tribes of California.

Recent Biological Opinions

While the southern Delta salinity standards are listed in the State Water Board’s various water quality control plans and water right decisions in that portion of water quality objectives that address the needs of human-oriented beneficial uses such as municipal, industrial, and agricultural uses, these salinity standards also simultaneously establish habitat criteria conditions for fisheries—both for in-Delta resident species like the state and federally-endangered Delta smelt as well as the endangered and crashing anadromous fish species. Fish cannot make the fine legal distinctions we do on matters of salt and flows; they swim in the same water that the salts dissolve in. Water of a fresher quality over time encourages establishment of freshwater habitat conditions here; saltier, brackish water leads perhaps to a different habitat over there. The Cease and Desist Order in Part A implicitly recognizes this interconnection of salinity policy with fisheries policy by providing DWR and USBR options to meet the southern Delta salinity standards in the range of corrective actions the water agencies may employ:

4. In the event that DWR and/or USBR projects a potential exceedance of the 0.7

²¹ Mike Taugher, “Pumping water and cash from Delta,” *Contra Costa Times*, May 23, 2009; Taugher, “Gaming the Water System,” *Contra Costa Times*, May 25, 2009; Taugher, “Paper Shuffle Allows for Vast Supply of Easy Money,” *Contra Costa Times*, May 23, 2009; Taugher, “Water ownership murky, complicated,” *Contra Costa Times*, May 23, 2009; Taugher, “The Resnicks: Farming’s Power Couple,” *Contra Costa Times*, May 23, 2009.

²² D-1641, p. 35: “Notwithstanding the unavailability of water to satisfy existing water rights in the southern Delta during certain periods, the SWRCB has determined that protection of agriculture in the southern Delta is in the public interest. Water quality objectives have been set for this purpose, and the USBR is responsible for meeting the Vernalis salinity objective.”

EC objective at Interagency Stations C-6, C-8, and P-12, prior to July 1, 2009, DWR and/or USBR shall immediately inform the State Water Board of the potential exceedance and shall describe the corrective actions they are initiating to avoid the exceedance. *Corrective actions may include but are not limited to additional releases from upstream Central Valley Project (CVP) facilities or south of the Delta State Water Project (SWP) or CVP facilities, modification in the timing of releases from Project facilities, reduction in exports, recirculation of water through the San Joaquin River, purchases or exchanges of water under transfers from other entities, modified operations of temporary barriers, reductions in highly saline drainage from upstream sources, or alternative supplies to Delta farmers (including overland supplies).*²³

DWR and the USBR cling rigidly to the near-term temporary barriers and longer-term permanent operable gates of their South Delta Improvements Program in hopes of avoiding costs to their store supplies. Echoing earlier State Water Board attempts under the 1988 Draft WQCP and the 1992 Draft D-1630, the recent biological opinions find that sole reliance on barriers will fail the fish with probably greater certainty than the current regulatory and engineering framework now in place has—because the current weak regulatory framework has weakened the pelagic and anadromous fisheries so thoroughly it won’t take much longer before extinction is visited upon them.

Delta Smelt. The US Fish and Wildlife Service’s recent Delta smelt biological opinion provides extensive agency review, based on consultation with both DWR and USBR, extensive review of scientific literature, and an independent review of the biological opinion in advance of its release. It is the product, in part also, of litigation that forced the Fish and Wildlife Service to redo an earlier flawed biological opinion on the effects of operating the Central Valley Project and the State Water Project on Delta smelt population trends and habitat needs.

This more recent Delta smelt biological opinion identifies the major stressors facing the Delta smelt stemming from CVP and SWP operations as:

- Entrainment of adult, larval, and juvenile fish in flows that lead directly to the export pumps operated by USBR and DWR in the Delta.
- Decreased availability in the Delta of critical aquatic habitat due to the specific timing of large freshwater export pumping, independent of entrainment of fish—when turbid and brackish conditions are preferred by adults;
- Entrainment of otherwise co-occurring food supplies, such as the freshwater planktonic prey species *Pseudodiaptomus forbesi* eaten by Delta smelt juveniles, in flows and subsequent removal from Delta channels by export pumping.²⁴

²³ CDO, p. 30.

²⁴ US Fish and Wildlife Service, *Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the Central Valley Project and State Water Project*, December 15, 2008, p. 203. Hereinafter cited as Delta Smelt BO, 2008. Throughout the BO’s discussion of the effects of the projects on the Delta smelt, “there is a specific focus on three major seasonally-occurring categories of effects: entrainment of delta smelt, habitat restriction, and entrainment of *Pseudodiaptomus forbesi*, the primary prey of delta smelt during summer-fall.”

The biological opinion identifies other stressors of this fish species, and is careful to enumerate them, including onshore and shoreward habitat loss, invasion by the overbite clam competing for similar food supplies (particularly in the western Delta), and other factors.²⁵ However, the biological opinion describes how the interaction of export pumps with Delta river flows results in Delta smelt entrainment:

Export of water from the Delta has long been recognized to have multiple effects on the estuarine ecosystem upon which species such as the delta smelt depend [citations]. In general, water is conveyed to Jones and Banks via the Old and Middle River channels resulting in a net (over a tidal cycle or tidal cycles) flow towards Jones and Banks. When combined water export exceeds San Joaquin River inflows, the additional water is drawn from the Sacramento River through the Delta Cross Channel, Georgina Slough, and Three-Mile Slough. At high pumping rates, net San Joaquin River flow is toward Banks and Jones [citations]. Combined flow in the Old and Middle Rivers is measured as “OMR” flows while flow in the San Joaquin River at Jersey Island is calculated as “Qwest” (Dayflow at <http://www.iep.ca.gov/dayflow/>). Flow towards the pumps is characterized as negative flow for both measurements. Further, OMR flow towards the pumps is increased seasonally by installation of the South Delta Temporary Barriers. In particular, the Head of Old River barrier reduces flow from the San Joaquin River downstream into Old River so more water is drawn from the Central Delta via Old and Middle Rivers.

Because large volumes of water are drawn from the Estuary, water exports and fish entrainment at Jones and Banks are among the best-studied sources of fish mortality in the San Francisco Estuary [citations]. As described in the Project Description, the Tracy Fish Collection Facility (CVP) and the Skinner Fish Facility (SWP) serve to reduce the mortality of fish entrained at Jones and Banks. The export facilities are known to entrain all species of fish inhabiting the Delta [citations], and are of particular concern in dry years, when the distribution of young striped bass, delta smelt, and longfin smelt shift upstream, closer to the diversions [citations]. As an indication of the magnitude of entrainment effects caused by Banks and Jones, approximately 110 million fish were salvaged at the Skinner Fish Facility screens and returned to the Delta over a 15-year period (Brown et al. 1996). However, this number greatly underestimates the actual number of fish entrained. It does not include losses through the guidance louvers at either facility. For Banks in particular, it does not account for high rates of predation on fish in CCF [citations]. Fish less than 30 mm forklength (FL) are not efficiently collected by the fish screens [citations].

The entrainment of adult delta smelt at Jones and Banks occurs mainly during their upstream spawning migration between December and April [citations]. Entrainment risk depends on the location of the fish relative to the export facilities and the level of exports [citations]. The spawning distribution of adult delta smelt varies widely among years. In some years a large proportion of the adult population migrates to the Central and South Delta, placing both spawners and their progeny in relatively close proximity to the export pumps and increasing entrainment risk. In other years, the bulk of adults migrate to the North Delta,

²⁵ Delta Smelt BO, 2008, p. 202. “While research indicates that there is no single primary driver of delta smelt population dynamics, hydrodynamic conditions driven or influenced by CVP/SWP operations in turn influence the dynamics of delta smelt interaction with these other stressors.”

reducing entrainment risk. In very wet periods, some spawning occurs west of the Delta.²⁶

According to the Interagency Ecological Program's DayFlow data, the export pumping activities during this decade included both record average decadal and annual export levels. (Exhibit C-WIN-8) The high pumping levels in the Delta in this decade correlate closely with precipitous declines in the population abundance of Delta smelt (Exhibit C-WIN-9), as well as the aforementioned crashes of Central Valley Chinook salmon races (Exhibit C-WIN-5).

The Delta smelt biological opinion's reasonable and prudent alternatives require that DWR and USBR rely on a combination of approaches to managing and balancing Delta water exports, upstream reservoir releases and river flows, temporary tidal barriers and potentially permanent operable gates, and the needs both to prevent and reduce Delta smelt entrainment at the pumps, expand its critical habitat, and prevent and reduce entrainment of its food supplies (e.g., planktonic prey species needed for the summertime growth of larval and juvenile Delta smelt).

The Delta smelt biological opinion states that the South Delta temporary barriers alter the hydraulics of the Delta that affect fish, and cause hydrodynamic changes within the interior of the Delta:

Under the Service's 2001 biological opinion for the SDTB [South Delta Temporary Barriers], operation of the barriers at Middle River and Old River near Tracy can begin May 15 or as early as April 15 if the spring barrier at the head of Old River is in place. From May 16 to May 31 (if the barrier at the head of Old River is removed) the tide gates are tied open in the barriers in Middle River and Old River near Tracy. After May 31, the barriers in Middle River, Old River near Tracy, and Grant Line Canal are permitted to be operational until they are completely removed by November 30.

During the spring, the HORB is designed to reduce the number of out-migrating salmon smolts entering Old River. During the fall, this barrier is designed to improve flow and DO conditions in the San Joaquin River for the immigration of adult fall-run Chinook salmon. The HORB is typically in place from April 15 to May 15 in the spring, and from early September to late November in the fall. Installation and operation of the barrier also depends on San Joaquin River flow conditions.

The SDTB cause changes in the hydraulics of the Delta that affect fish. The SDTB cause hydrodynamic changes within the interior of the Delta. When the HORB is in place, most water flow is effectively blocked from entering Old River. This, in turn, increases the flow to the west in Turner and Columbia cuts, two major Central Delta channels that flow toward Banks and Jones [pumping plants].²⁷

When the temporary barriers are in place, and export pumping is high, Delta smelt can still be entrained to the pumps because downstream of the tidal barriers, Old and Middle River flows become increasingly negative (i.e., they flow upstream toward

²⁶ Delta Smelt BO, 2008, pp. 160-161.

²⁷ Delta Smelt BO, 2008, p. 175.

Clifton Court Forebay and the export pumps on Old River). The Fish and Wildlife Service acknowledges that permanent operable gates will be easier to operate in real time to meet Delta smelt needs, provided that the biological opinion's monitoring program and adaptive management process are employed. However, their design and construction is to be the subject of additional consultation among the Service, DWR, and USBR.²⁸

As an overall strategy for addressing salinity and fish protection issues in the south Delta, the Delta smelt biological opinion combines into its Reasonable and Prudent Alternatives operation of temporary barriers, eventual permanent operable barriers, but also includes measures that would increase freshwater flows at key times of year in relation to the larval, juvenile, and adult life history needs of the Delta smelt. Simply stated, the FWS position is that neither temporary barriers nor permanent operable gates should be installed *without providing a framework of additional San Joaquin River flows at key times* that will benefit Delta smelt so as to avoid the entrainment issues, and to assist with expanding critical habitat at key times of year, something the Draft 1988 Water Quality Control Plan and the Draft 1992 D-1630 called for a generation ago.

Salmonids. The situation for salmonid migration—whether bound for the ocean or headed for their upstream spawning habitat—and residence in the Delta is even more pressing, since collectively they are species relied on as a human food source. Their bodies migrating upstream represent vessels of energy and nutrition imported from the Pacific Ocean for not only human consumption but for replenishment of the riparian ecosystems of the Central Valley and Sierra foothills, at least, as high upstream as they can make it these days. Immediate protection and regulation of beneficial uses of water to promote their population doubling—as called for in the Central Valley Project Improvement Act of 1992—would be in the public interest for all of California, and yet is in danger of being lost to extinction in our lifetimes.

The National Marine Fisheries Service's salmonids biological opinion on proposed future operations of the Central Valley Project and State Water Project takes account of the flow patterns in the southern Delta, through which salmon migrate and rear every year. When the export pumps are operating:

Under natural conditions with no pumping, water flows downstream in a net positive direction towards the ocean. Under current conditions, the flow patterns have become much more complex. When pumping rates are high at the project facilities, water is drawn towards the two points of diversion, *i.e.*, the SWP's Clifton Court Forebay and the CVP's Tracy intake. Water moves downstream through the Head of Old River and through the channels of Old River and Grantline/Fabian-Bell Canal towards the pumps. Conversely, water to the north of the two facilities' diversion points moves southwards (upstream) and the net flow is negative. This pattern is further complicated when the temporary barriers are installed from April through November, and internal reverse circulation is created within the channels isolated by the barriers from the rest of the South Delta (discussed later in the Temporary Barriers Section). These conditions are most evident during late spring through fall when river inflows are lower and water diversion rates are high. Dry hydrological years also exacerbate the loss of net downstream flows in the South Delta.²⁹

²⁸ Delta Smelt BO, 2008, pages 226-227, 241, 242, and 244.

²⁹ National Marine Fisheries Service, Southwest Region, *Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project*, Endangered Species Act Section 7 Consultation, June 4, 2009, p. 214. Hereinafter cited as Salmonid BO, 2009.

Typical of the problems anadromous Central Valley Chinook salmon and steelhead face is found where NMFS describes the problems facing juvenile steelhead, which are reminiscent of those facing juvenile and larval Delta smelt:

Juvenile CV [Central Valley] steelhead that outmigrate from the San Joaquin River tributaries are exposed to degraded migration corridors, just as they are exposed to degraded water quality in the lower San Joaquin River basin and the Stockton DWSC. Significant amounts of flow and many juvenile CV steelhead from the Sacramento River enter the [Delta Cross Channel] (when the gates are open) and Georgiana Slough into the central Delta. Likewise, some juvenile CV steelhead from the San Joaquin River are diverted into the southern Delta through Old River and Turner and Columbia Cuts. Mortality of juvenile CV steelhead entering the central Delta is higher than for those continuing downstream in the Sacramento and San Joaquin rivers. This difference in mortality could be caused by a combination of factors: the longer migration route through the central Delta to the western Delta, exposure to higher water temperatures, higher predation rates, exposure to seasonal agricultural diversions, water quality impairments due to agricultural and municipal discharges, and a more complex channel configuration making it more difficult for CV steelhead to successfully migrate to the western Delta and the ocean. In addition, the State and Federal pumps and associated fish facilities increase mortality of juvenile CV steelhead through various means, including entrainment into the State and Federal facilities, handling, trucking, and release.³⁰

The temporary hydraulic barriers in the southern Delta channels are intended in part to stabilize water levels for South Delta farmers and to guide outmigrating salmon and steelhead smolts down the mainstem of the San Joaquin River, and keeping them from entering the head of Old River on the way to entrainment in the project export pumps. Well-intentioned as these barriers are, they pose other problems for outmigrating salmonids:

The physical structures of the permanent barriers also create predator habitat within the channels of the South Delta. ... This condition is expected to create localized turbulent flow over the structure on a fine spatial scale. Fine scale flow disruption creates microhabitats by increasing the complexity of the boundary layer along the channel bottom or margins. Predators can utilize these microhabitats to hold station in while waiting for prey to pass by. This disruption of the flow field is on the order of a few meters or less and would not be captured by the hydraulic modeling previously done for the project. An example of such microhabitat would be a boulder or ledge in a stream, which provides relief from the stream flow to a fish, such as a trout, holding below it. The placement of the four gates [in the interior south Delta channels] will ensure that any fish entering the channels of the South Delta, whether from the San Joaquin River side via the Head of Old River or from the western side via one of the three channels with gates, will have to negotiate at least two gates to move through the system. *The argument that the gates only occupy a small footprint in the South Delta and therefore do not create an additional risk of predation is false. The physical structures of the gates create a point where predation pressure is increased and*

³⁰ Salmonid BO, 2009, pp. 112-113.

which migrating fish must negotiate to complete their downstream journey if they enter the South Delta channels. The environmental stressors created by the implementation of the SDIP [South Delta Improvement Program] will add to the already existing stressors present in the San Joaquin River basin.³¹

Pressure for fish protection flows to accompany any operation of the temporary barriers is even stronger in the Salmonid BO of 2009, and must be considered by the State Water Board in the matter before you today and when you revise the 2006 Water Quality Control Plan:

The conclusions drawn from these findings are that even with a 30-day reduction in pumping (*i.e.*, a VAMP-like scenario or an EWA style export curtailment) significant levels of particle entrainment still occurs in the channels of the South Delta and Central Delta and that 30 days of pumping reduction may not be sufficient to reduce overall entrainment. This situation is exacerbated by low inflows from the San Joaquin River basin, even if delta outflow is increasing due to higher Sacramento River flows occurring simultaneously.³²

The National Marine Fisheries Service has a different view of the permanent operable gates that DWR and USBR have been committed to since 1991: NMFS expects that the operation of the permanent gates proposed for the SDIP will have many of the same effects as described for the TBP in regards to changes in the regional hydrodynamics and the increase in predation levels associated with the physical structures and near-field flow aspects of the barriers. ...In winter, the [Head of Old River Barrier] is completely removed while the majority of the three agricultural rock barriers are removed, leaving only portions of the the side abutments containing the culverts remaining in the river channel. ...Addition of the barriers in spring is in response to the ongoing export actions of the project and the requirement to provide suitable water surface elevations in the south Delta for agricultural diversions.

As described in previous sections, future pumping rates are expected to increase during the April and May time frame over the current conditions due to the reduction in “environmental” water available to make export curtailments. *Although the reduction in “environmental water” is not related to the proposed SDIP action, it does coincide with the proposed operations of the permanent gates in April and May, and therefore has bearing on the effects of the gates on fish drawn into the South Delta by the export actions.* Based on the description and analysis for the SDIP in the draft EIR/EIS (DWR 2005) and the SDIP Action Specific Implementation Plan (DWR 2006), the stated purposes for the permanent gates, includes maintaining surface water elevations for South Delta agricultural diverters and enhancing the flexibility to operate the CVP and SWP exports without impacting the South Delta diverters. *Operations of the inflatable gates from June through November likewise enable the projects to more frequently sustain higher levels of pumping within regulatory and operational parameters by avoiding impacting South Delta water elevations and reducing the electrical conductivity levels in the South Delta waterways. It does this by “trapping” high quality Sacramento River water upstream of the permanent operable gates and redirecting its flow within the channels to improve water quality and circulation*

³¹ Salmonid BO, 2009, p. 395. Emphasis added.

³² Salmonid BO, 2009, p. 396.

*between the three agricultural gates. During the flood tide, higher quality water with Sacramento River origins flows upstream past the position of the gates and provides the desired water quality conditions within the South Delta channels. Without the gates, this higher quality water would flow back downstream on the ebb tide and not provide the desired water quality improvements upstream of the gate positions during all phases of the tidal cycle.*³³

The purported benefit of the SDIP proposal to fisheries management was the Head of Old River gate, which was supposed to reduce the entrainment of fall-run originating from the San Joaquin River basin during their spring out migration period. CV steelhead migrating from the San Joaquin Basin during the Head of Old River gate operations were also believed to have been protected by the gate. Based on the PTM simulation results and the telemetry findings, this protective aspect of the Head of Old River operable gate appears to be overstated, and in fact the operation of the gate may place fish entering the system from other tributaries such as the Calaveras River, Mokelumne River, and Sacramento River at greater risk of entrainment when it is in operation. In order to achieve the proposed benefits of the operable gate at the Head of Old River, reductions in exports, coupled with increases in San Joaquin River flows to move fish through the system are needed. Without these concurrent actions, the full benefit of the operable gate cannot be realized. The proposed SDIP action did not make this linkage part of the operations.³⁴

The National Marine Fisheries Service endorses continuation of pulse flows, as indicated in this passage about Vernalis Adaptive Management Program flows implemented under D-1641, originally under Order WR 95-6:

[Tuolumne and Merced River VAMP] flows are integral to stimulating outmigration of both the threatened CV steelhead, and fall-run, a species of concern under the ESA, from the Tuolumne River and Merced River. Furthermore, decreases in the pulse flows on these rivers would be an adverse modification of critical habitat designated for CV steelhead in regards to flow related decreases in rearing area suitability and physical and flow related obstructions in the migration corridors from the rearing areas below the dams, downstream to Vernalis on the San Joaquin River where the Stanislaus River enters.³⁵

And yet decreased pulse flows, which DWR and USBR consider a waste of water (ignoring the public interest in preserving aquatic habitat for human-dependent beneficial uses like fish), are exactly what is contemplated in the long-term operations of the Central Valley Project and State Water Project, as described in the Salmonid BO:

Under the future proposed VAMP-like operations, spring pulse flows are only linked to the Vernalis standard. Reclamation and DWR have not elaborated the details of this plan, particularly if pulse flows will continue on the Merced and Tuolumne rivers as has occurred historically in the VAMP experiment. Decreased flows on these rivers would create a situation in which the downstream water temperatures on the valley floor would become warmer with the progressively increasing air temperatures experienced during a typical spring in the Central

³³ Salmonid BO, 2009, pp. 391-392. Emphasis added.

³⁴ Salmonid BO, 2009, p. 397.

³⁵ Salmonid BO, 2009, p. 420.

Valley. As spring progressed, the increasing air temperature would continue to warm the river water and create thermal barriers within the downstream reaches of the river channel. Without a suitable pulse of cooler water moving downstream from increased dam releases to breakdown this thermal barrier, juvenile salmonids would be unlikely to survive their migration downstream to the Delta, dying from excessive thermal exposure en route. The only recourse is to remain within the reaches immediately below the terminal dams and reside in the cool tailwater reaches of the river over the summer and emigrate the following fall or winter when air temperatures decrease with the onset of winter. Unfortunately, due to the restricted habitat available below the dams with sufficient cool water to maintain suitable habitat requirements for either steelhead or fall-run Chinook salmon, density dependent mortality is anticipated to occur. There is currently insufficient space in the tailwater sections of these tributaries to support a large population of over summering salmonids under current summertime releases, and this is itself identified by NMFS as a limiting factor in steelhead recovery in the San Joaquin River basin. Forcing increased numbers of Chinook salmon and steelhead to compete for the limited over summering habitat and their resources (food, holding areas, cover, *etc.*) due to lack of sufficient outmigration spring pulse flows, would place additional stressors on the remaining populations of CV steelhead that would “normally” be present in these areas over the summer.

The congressionally-mandated Anadromous Fisheries Restoration Program set a target of doubling of anadromous fish populations over the historical average between 1967 and 1991, discussed above. The AFRP plan, developed by the US Fish and Wildlife Service, is reported by NMFS to call for increased flows to support increased salmonid production throughout the Central Valley:

Like the previous reports, the AFRP Restoration Plan recommended increasing flows within the tributaries and mainstem San Joaquin River as a high priority action to increase salmonid production. Within the Delta, actions which would provide protection to juvenile salmonids migrating through the Delta from November 1 through June 30, equivalent to the protection provided by restricting exports to minimal levels, were given high priority. The specific increases in flow were developed to achieve the targeted doubling of fish populations as required under the CVPIA, and are not necessarily the flows needed to sustain or protect populations from further decline or achieve population stability. Targeted flows are typically much greater than the average or median flows observed in the rivers under current conditions.³⁶

The State Water Board’s adopted 1995 Water Quality Control Plan includes the anadromous fish doubling standard in its fish and wildlife water quality standards as a narrative objective. As it prepared its 2006 Water Quality Control Plan, the State Water Board was told by the California Department of Fish and Game that Vernalis Adaptive Management Program spring pulse flows (which would range from 2,000 cfs in the San Joaquin at Vernalis in critical years to 7,000 cfs in wet years)

were not adequate for the long-term protection of fall-run beneficial uses in the San Joaquin River basin because: (1) the San Joaquin River salmon population trend continues to be below the 1967 - 1991 historic average upon which the narrative Doubling Goal was established (CVPIA Restoration Plan goals); (2) salmon smolts are not afforded the level of protection as envisioned by the 1995 WQCP; (3) the VAMP experiment is not working because it has not been

³⁶ Salmonid BO, 2009, p. 424. Emphasis added.

implemented as designed; and (4) spring outflow is the primary factor controlling fall-run population in the San Joaquin River basin. CDFG summarized the shortfalls of the 1995 WQCP Vernalis flow objectives as being due to: (1) the diminished magnitude of the Vernalis flow objective; (2) the narrowness of the pulse flow protection window; (3) the infrequent occurrence of elevated flow objective levels; and (4) the frequent occurrence of reduced flow objective levels. CDFG found in the development of their spreadsheet model that non-flow parameters had little or no relationship to fall-run population abundance and that spring-time flow magnitude, duration, and frequency were the dominant factors influencing Chinook salmon abundance in the basin. In their analysis of the influence of exports and flow on salmon production, CDFG could not find a statistically significant role for exports compared to the influence of the spring time flows. The role of flow always dominated the interaction of exports and flow on salmon abundance. ...CDFG recognized that the influence of delta exports upon San Joaquin River salmon production was not totally clear but that its influence was not as negative, at least compared to flows, as it had previously been thought to be. Its analysis indicated that comparatively, flows were the much more influential variable in determining [salmonid] production levels in the basin compared to exports.³⁷

The State Water Board did provide for the Vernalis Adaptive Management Program pulse flows as proposed, rather than increase them in 1995. The flows were arrived at through a multi-party San Joaquin River Agreement, in which the USBR paid \$3 million per year and DWR paid \$1 million to the San Joaquin River Group Authority (a consortium of senior water right holders largely on the eastern side of the San Joaquin Valley) to provide the pulse flows for the program. Under the current OCAP, as mentioned, the Vernalis pulse flows will wane, decreasing critical habitat for Tuolumne and Merced River steelhead in the form of lower flows, warmer water temperatures and greater risk of disease and mortality, and heightened competition for scarce food supplies:

Reductions in springtime pulses reduce the cues for steelhead to initiate their downstream emigration at an appropriate time. ...Temperatures during spring increase on the valley floor and the altered hydrology of the tributaries due to dams prevents runoff from spring snowmelt from providing a continuous corridor of appropriately cool water between the rearing areas (now below the dams) with the lower valley floor reaches running down the middle of the San Joaquin Valley. This connection must now be made from controlled releases from the terminal dams. Without the releases, the downstream sections of the tributaries and valley floor sections of the San Joaquin River are too warm to provide appropriate thermal conditions for emigrating steelhead. Warmer temperatures may prove to be fatal in their own right, but are also expected to reduce the condition of the emigrating steelhead and make them more susceptible to predators and disease. Reduced flows are also likely to increase the population density of steelhead in the shrinking habitat below the dams as the weather warms. The outcomes of this truncated rearing habitat were previously explained in the effects section for this action. Overall survival is expected to decrease with the reduction in the value of the freshwater rearing habitat available to the steelhead.³⁸

³⁷ Salmonid BO, 2009, pp. 425-426.

³⁸ Salmonid BO, 2009, pp. 426-427.

For now, largely because of its concerns with predation around the current temporary barriers and the in the future with the permanent operable barriers, the National Marine Fisheries Service declared in its Reasonable and Prudent Alternatives that “DWR shall not implement the South Delta Improvement Program, which is a proposal to replace temporary barriers with permanent operable gates.”³⁹ Currently, the temporary barriers, says NMFS, may operate under a 2008 NMFS BO through 2010. This BO found that the temporary barriers would not jeopardize the continued existence of listed species or adversely modify critical habitat. This seems plausible as well, since the VAMP experiment is lawful under D-1641 through December 2011. And, as noted above, DWR has three years of predation studies to do on the temporary barriers as part of a new consultation with NMFS over the effects of these barriers, and of potentially operable gates on salmonid fisheries in the south Delta.

Hearing Questions

The Delta Vision Blue Ribbon Task Force, Little Hoover, and others have noted that the administration of water pollution control laws by the State Water Resources Control Board and its Regional Boards is behind the times and in need of modernization and greater transparency. Greater accountability of the Regional Boards to the State Water Board is also desperately needed. We also believe that, in the case of the CDO on southern Delta salinity standards, an important purpose of all of this administrative improvement must be to gain positive and measurable results: to protect all beneficial uses of the Delta, including agricultural producers and the salmon fisheries—and to do so as quickly as possible while there are still fish to protect.

The State Water Board asks two questions of the parties to this evidentiary hearing about the petition to modify the CDO:

1. What modifications, if any, should the State Water Board make to the compliance schedule set forth in Part A of Order WR 2006-0006, and how should any modifications be structured to take into account any potential changes to the southern Delta salinity objectives or the program of implementation that may occur as a result of the State Water Board’s current review of the Bay-Delta Plan?
2. If the compliance schedule contained in Part A of Order WR 2006-0006 is modified, what interim protective measures, if any, should be imposed?

Regarding Hearing Question 2, the California Water Impact Network recommends retaining all facets of the CDO compliance schedule in Part A, except as follows:

- ***Amend Condition A.2 to read:*** “Within 60 days from the date of this order, DWR and USBR shall submit a detailed plan and schedule to the Executive Director for compliance with the conditions mentioned above, including planned completion dates for actions that will obviate the ~~current~~ threat of non-compliance with the 0.7 EC objective at stations C-6, C-8, and P-12. ~~July 1, 2009.~~ If the plan provides for implementation of equivalent measures,

³⁹ Salmonid BO, 2009, p. 659.

DWR and USBR shall submit information and analysis establishing that those measures will provide salinity control at the three compliance stations ~~equivalent to the salinity control that would be achieved by permanent barriers needed to protect agricultural and fish and wildlife beneficial uses represented in southern Delta salinity and anadromous fish population doubling narrative standards while also protecting water levels in south Delta channels so that riparian right holders in this area are not injured by state and federal water management operations in the Delta, and fish passage, protection and legislative recovery goals are accomplished.~~ The plan and schedule ~~shall be~~ ~~are~~ subject to approval by the Executive Director of the State Water Board, shall be comprehensive, and shall include significant project milestones. DWR and USBR shall submit any additional information or revisions to the schedule and plan that the Executive Director requests within the period that the Executive Director specifies. DWR and USBR shall implement the plan and schedule as approved by the Executive Director.

- ***Add a new condition stating:*** “Within 120 days from the date of this Order, DWR and USBR shall submit a detailed plan and schedule to the Executive Director for compliance with the conditions mentioned above, including planned completion dates for actions that will implement pulse and increased base flows at key times of years identified in the US Fish and Wildlife Service and National Marine Fisheries Service biological opinions concerning the effects of the proposed long-term operations and criteria plan for the Central Valley Project and State Water Project on Delta smelt and Central Valley salmonid species. The plan should be consistent with, incorporate, and implement reasonable and prudent alternative actions proposed by the services using real time monitoring and adaptive management with the principal goal of long-term survival for Delta smelt. The plan should also incorporate and implement reasonable and prudent alternative actions from the salmonid biological opinion applicable to the southern Delta, consistent with the state and federal goals of doubling the anadromous fishery populations of the Central Valley. This plan should also provide the Executive Director with a workplan for consultation with fisheries agencies and the State Water Resources Control Board to achieve the narrative doubling of anadromous fish populations as required by federal law.
- ***Amend Condition A.4 to read:*** “In the event that DWR and/or USBR projects a potential exceedance of the 0.7 EC objective at Interagency Stations C-6, C-8, and P-12, prior to July 1, 2009, DWR and/or USBR shall immediately inform the State Water Board of the potential exceedance and shall describe the corrective actions they are initiating to avoid the exceedance. Corrective actions ~~may~~ shall include but are not limited to additional releases from upstream (south of the Delta) Central Valley Project (CVP) facilities or south of the Delta State Water Project (SWP) or CVP facilities, modification in the timing of releases from Project facilities, reductions in exports, recirculation of water through the San Joaquin River, purchases or exchanges of water

under transfers from other entities, modified operations of temporary barriers, or reductions in highly saline drainage from upstream sources (including through permanent land retirement), ~~or alternative supplies to Delta farmers (including overland supplies).~~”

- We request that the State Water Board add the California Water Impact Network to the list of entities to whom DWR and USBR shall serve copies of all reports, plans, and other communications required under the Cease and Desist Order.

Regarding Hearing Question 1, the California Water Impact Network submitted extensive comments prior to the June 15, 2009, deadline to the State Water Resources Control Board concerning the Periodic Review staff report on the 2006 Bay-Delta Water Quality Control Plan. We incorporate that document by reference here. In addition, we recommend that the Board make the south Delta salinity standard to protect agricultural beneficial uses consistent with other Delta water quality standards by subjecting the EC readings to a 14-day running average, rather than a 30-day running average.

Thank you for considering this testimony.